

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	
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Michael HERMANN	)	Group Art Unit: 2872
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Application No.: 09/817,797	)	Examiner: A. Y. Chang
	:	
Filed: March 27, 2001	)	Confirmation No. 8356
	:	
For: DEVICE FOR QUANTITATIVE	)	
ASSESSMENT OF THE ALIGNED	:	
POSITION OF TWO MACHINE	)	
PARTS, WORKPIECES OR THE LIKE :	:	

**AMENDMENT AFTER SECOND RCE**

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

The following is presented in response to the Office Action that was mailed on November 14, 2005, in connection with the above-identified application, a suspension of Action on this application after filing of a second RCE having been granted to August 15, 2006.

AMENDMENTS TO THE CLAIMS:

1. (Currently Amended) Device for measuring or evaluating the relative ~~parallel offset and~~ angular offset position of two elements with respect to each other, comprising:

- a collimated light source means for producing at least one light beam connected to a first of the two elements at a known ~~co~~ordinate location;

- a first two-dimensionally readable optoelectronic sensor and at least one second two-dimensionally readable optoelectronic sensor connected to a second of the two elements each of which are in a fixed relative alignment with respect to each other at a known ~~co~~ordinate location such that a portion of said at least one light beam incident on a surface of an optoelectronically active layer of the first optoelectronic sensor is reflected by the surface of the optoelectronically active layer as a light beam directly onto a surface of the at least one second two-dimensionally readable optoelectronic sensor;

- electronic means for receiving output signals from each of the optoelectronic sensors representing the coordinates at which the at least one light beam and reflected portion of the at least one light beam are detected on each respective sensor of the optoelectronic sensors, processing the signals, and computing the relative angular offset position of the two elements with respect to each other ~~position of the light source means relative to the incidences of the at least one light beam on the surfaces of the two-dimensionally readable optoelectronic sensors based on the coordinates detected relative to coordinates at which the at least one light beam would be detected if the parallel and angular offsets of the elements are zero.~~

2. (Canceled)

3. (Currently Amended) Device for measuring or evaluating the relative ~~parallel offset and~~ angular offset position of two elements with respect to each other, comprising:

- a collimated light source for producing at least one light beam connected to a first of the two elements at a known ~~co~~ordinate location;
- a first two-dimensionally readable optoelectronic sensor and at least one second two-dimensionally readable optoelectronic sensor;
- a housing, connected to a second of the two elements at a known ~~co~~ordinate location, in which the first and second two-dimensionally readable optoelectronic sensors are positioned relative to one another at a known ~~co~~ordinate location with respect to said housing such that a portion of the light beam incident on the first two-dimensionally readable optoelectronic sensor is reflected as a plurality of light beams in a folded beam path by a surface of an optoelectronically active layer of the first optoelectronic sensor directly onto the second two-dimensionally readable optoelectronic sensor;
- electronic means for receiving output signals from the optoelectronic sensors, processing the signals representing the coordinates at which the at least one light beam and reflected portion of the at least one light beam are detected on each respective sensor of the optoelectronic sensors,[[.]] and computing the relative ~~parallel offset and~~ angular offset position of the housing relative to the light source based on the coordinates of incidences of the at least one light beam on the surfaces of the two-dimensionally readable optoelectronic sensors detected ~~relative to coordinates at which the at least one light beam would be detected if the parallel and angular offsets of the elements are zero.~~

4. (Currently Amended) Device for measuring or evaluating the relative ~~parallel offset and~~ angular offset position of two elements with respect to each other, comprising:

- a collimated light source means for producing at least one light beam at a known coordinate location;
- a first two-dimensionally readable optoelectronic sensor;
- at least one second two-dimensionally readable optoelectronic sensor in a fixed relative alignment with respect to the first two-dimensionally readable optoelectronic sensor at a known coordinate location such that the at least one light beam from the light source means is incident on a surface of an optoelectronically active layer of the first two-dimensionally readable optoelectronic sensor and a portion of the at least one light beam is reflected by the surface of the optoelectronically active layer as at least one light beam directly onto a surface of the at least one second two-dimensionally readable optoelectronic sensor;
- electronic means for receiving output signals from each of the optoelectronic sensors, processing the signals representing the coordinates at which the at least one light beam and reflected portion of the at least one light beam are detected on each respective sensor of the optoelectronic sensors, and computing the relative angular offset position of the light source means relative to the incidences of the at least one light beam on the surfaces of the two-dimensionally readable optoelectronic sensors ~~based on the coordinates detected relative to coordinates at which the at least one light beam would be detected if the parallel and angular offsets of the elements are zero.~~

REMARKS

By the above amendments, the claims 1, 3 and 4 have been further amended. In view of these actions and the following remarks, further consideration of this application is requested.

The Examiner has objected to the preceding amendment of August 30, 2005, as containing new matter with regard the reference to a "known coordinate location" with respect to the light source means, the first optoelectronic sensor and the manner in which results are obtained and has rejected the claims on the same basis under 35 USC § 112, first paragraph. Without conceding the correctness of the Examiner's positions, to advance prosecution, the following remedial steps have been taken. Firstly, the reference to the know location of the light source means and first optoelectronic sensor being a coordinate location has been change to simply a known location. It is submitted that anyone of any skill in the art would realize that the locations of these elements would be known, and that such is necessary to the evaluation process. Additionally, with regard to the computing function, the language objected to by the Examiner has been removed and instead it is set forth that the relative angular offset position of the two elements with respect to each other is computed based on the coordinates detected by the sensors. It is submitted that such language is fully supported by the original disclosure of paragraphs [0020] and [0021]. Accordingly, withdrawal of the objection based on new matter and the rejection of the claims on the same basis under 35 USC § 112, first paragraph is requested

The claims were also rejected as being based on a non-enabling disclosure. However, as now amended, it is submitted that they are fully supported by disclosure, now being limited to the determination of the angular offset, the is clearly described in the specification at least in the paragraphs noted above, and which, from Examiner's comments relative to the Miller patent, the Examiner now recognizes to be obtainable from the use of two sensors. As for the Examiner's comment that "the two sensors only have information to determine the position between the two sensors but not the

two elements” is simply not correct. Since the position of the sensors and the light source is known and these elements, in use, are mounted on the elements, it is possible to mathematically determine from the impact coordinates of the light beam and reflected light beam what is the relative angular offset of the elements. In this regard, as previously noted, paragraph [0002] states that the references cited in the specification describe “[p]rocesses of the type to which the present invention is directed” and it is expressly stated that “in this connection reference should be made to the teaching thereof.” Is it the Examiner’s contention that these U.S. patents are invalid for failure to provide an enabling disclosure? On the other hand, the Examiner has failed to explain why the teaching this reference as to how a light beam from collimated light source connected to a first of the two elements at a known location and directed to sensors on the other of the elements, the location of which relative to each other and the light source is also known, can be used to determine angular offset of the elements from deviation of a light beam is not applicable to the present invention. As for the Examiner’s comments on page 5 of the Action, they appear to be an exaggeration the does not reflect the actual situation and simply are not relevant to the claims as now presented. The Examiner has apparently ignored the fact that the light source and sensors are mount on the elements the relative positions of which are being determined, and it is an incorrect statement for the Examiner to assert than merely knowing the absolute position of the sensors and light source is sufficient to determine angular offset. Accordingly, withdrawal of the rejection of the claims under § 112 as being based on a non-enabling disclosure should now be withdrawn.

Turning now to the Examiner’s rejection of claims 1, 3 and 4 under 35 U.S.C. 103(a) as being unpatentable over the Holzl ‘998 patent when viewed in conjunction with applicant’s admitted prior art, since this rejection has been maintained based upon the § 112 issues that should now be withdrawn, applicant hereby incorporates by reference its prior positions supporting applicant’s view that this rejection is totally inappropriate, as is the Examiner’s failure to give appropriate weight to the declaration evidence submitted that clearly and unequivocally establishes that the

invention is not obvious from anything taught by Hölzl when considered in combination with that which was known to those of ordinary skill in the art. For convenience, these arguments are quoted below:

"Firstly, the Examiner has recognized the structural difference between the arrangement of the present application in which the first optoelectronic sensor reflects light to the second optoelectronic sensor in contrast to the arrangement of Hölzl that he relies upon in which a portion of the light incident on the first optoelectronic sensor is transmitted through it to the second first optoelectronic sensor. However, rather than analyze why one of ordinary skill in the art would find it obvious to abandon the light transmissive arrangement of Hölzl and adopt the light reflective arrangement, as is require for proper establishment of a prima facie case of obviousness, the Examiner goes on to rationalize why going from one to the other is nothing more that "an obvious matter of design choice" based on functional and operation considerations which totally fail to address the structural issues involved or even to properly assess the state of the art and the differences between it and the claimed invention as required.

For example, the Examiner states that "it is implicitly true the whether the light incident on the second detector is reflected or transmitted from the first detector the operational principle for obtaining the relative position between the two shafts or elements do not change." However, this simplistic approach ignores the fact that using a reflective approach would require an entirely different positioning of the two sensors relative to each other and the light source (compare Figs. 3 & 4 of the present application and Figs. 2 & 3 of Hölzl) which, in turn, affects packaging of the components and how they would be usable on the shafts being aligned. For example, if sensor 9 were reflective instead of transimissive, sensor 10 could not be located on the opposite side of the sensor 9 from the light source as is shown by Hölzl.

Furthermore, the Examiner's reliance on applicant's admission that he has found commercially available optoelectronic sensors which sufficient reflectivity to be usable for his purposes does nothing to advance the Examiner's conclusion of

obviousness. That is, only the Applicant has established that sufficient light can be reflected from the surface of a first optoelectronic sensor to be received upon the surface of a properly positioned second optoelectronic sensor to enable the second sensor to sense the impinging reflected light and output a signal which accurately represents the position of the reflected light (beam) on the second optoelectronic sensor, and the Examiner has produced no evidence to indicate otherwise. The fact that a two optoelectronic sensor system can be used to determine accurate positional relationships between machine parts or elements is not an issue relevant to a determination of obviousness of the present invention since Hölzl already clearly establishes that fact. The true issue is as noted above, given that the art does not teach use of the reflectance of an optoelectronic sensor in the manner of the present invention, why would it have been obvious to do so. Relevant to the Examiner's inappropriate assessment of obvious is the Board of Appeals case of Ex Parte Gerlach and Werner, 212 USPQ 471, (1980) which states that:

There is nothing in the statutes or the case law which makes 'that which is within the capabilities of one skilled in the art' synonymous with obviousness.

The examiner provides no reason why, absent the instant disclosure, one of ordinary skill in the art would be motivated to change [the structure of the references to that which was claimed].

Similarly, the Federal Circuit has stated that the mere fact that a modification could be made does not make it obvious absent a teaching of desirability; see, In re Deminski, 230 USPQ 313 (Fed. Cir. 1886); In re Gordon, 221 USPQ 1125 (1984). In the present case, not only has the Examiner failed to provide the requisite reason or motivation for what he contends to be obvious, but he does not even attempt to determine what changes would be needed since more than a mere change of one sensor for another is required. Thus, the Examiner is reminded the Examiner is required to make the factual determinations set forth in Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 48 (Supreme Court 1966) and to provide reason why one having ordinary skill in the art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention based upon some teaching, suggestion or



inference in the prior art, *Uniroyal, Inc. v. Rudkin-Wiley*, 5 USPQ2d 1434 (Fed. Cir. 1988). The statement that something is an "obvious design choice" is a mere conclusion for which some factual evidence in the prior art must be established, something the Examiner has wholly failed to do.

For example, the Examiner has failed to indicate where it is taught or suggested by the AAPA (or Holzl) that the reflective capabilities of the surface of a first optoelectronic sensor can be utilized in a two-sensor position determination system. The AAPA merely is that applicant has found a known sensor which will serve his needs but where is it indicated that anything was known to those other than applicant which would have led them to believe that any reflectance possessed by such sensors was anything other than a detriment given Holzl and others use the transmittance of the first optoelectronic sensor to provide accurate position determinations in combination with a second optoelectronic sensor receiving the transmitted light from the first optoelectronic sensor, not reflectance, such that such a sensor would logically have an anti-reflectance coating applied if it were to be used for a Holzl type system.

In fact, it was previously indicated how, conventionally, optoelectronic sensors are provided with an anti-reflection coating to reduce the reflectivity of the sensor, i.e., improve the transmittance as required by Holzl, a search of the USPTO patent database having been submitted that revealed more than 1000 patents which disclose such coatings for optoelectronic sensors. Simply put, the Examiner has not met his burden of establishing, through any teachings of Holzl or the AAPA, that one of ordinary skill in the art would recognize that the reflective characteristics of the surface of an optoelectronic sensor, rather than being an undesirable feature (as evidenced by the common use of anti-reflection coatings on such sensors) could be used to advantage. To the contrary, only the present inventor has determined that, contrary to conventional wisdom, a simple low cost apparatus for determining the positional relationship of elements which avoids the need for a partially transmitting

reflector can be produced based on using a sensor with a light reflective, not a light transmissive, surface.

Still further, if it were obvious to the reflectivity of known sensors, why would the devices of the referenced U.S. Patents 6,337,742 and 6,476,914 (which are more recent than that of the Hölz patent relied upon by the Examiner) have found it necessary to use mirrors and prism instead of the reflective capacity of the sensors? In this regard, it is noted Hölz is also one of the inventors of U.S. Patent 6,476,914, further indicating that the ability to rely on the reflectivity of the sensors was not apparent to those skilled in the art.

Therefore, in light of the deficiencies in the Examiner's assessment commented upon above, a prima facie case of obviousness has not been established by the combination of the teachings of Holz and AAPA, and consequently, the rejection of claims 1, 3 and 4, under § 103(a), is improper and should now be withdrawn."

The present application should now be in condition for allowance and action to that effect is requested. However, should the Examiner find some issue to remain unresolved, or should any new issue arise, which could be eliminated through discussions with the Applicant's representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited. Likewise, if the Examiner has some proposal for revisions to the claims that would facilitate allowance of this application, she is invited to present same to applicant.

Respectfully submitted,

By: 

David S. Safran  
Registration No. 27,997

Roberts Mlotkowski & Hobbes P.C.  
P.O. Box 10064  
McLean, VA 22102  
Direct Telephone: (703) 584-3273